

What is claimed is:

1. A method of operating a product, comprising:  
monitoring a first diagnostic information of a component of the product;  
monitoring a second diagnostic information of a system of the product, the system  
5 including the component;  
combining the first diagnostic information of the component and the second  
diagnostic information of the system; and  
based at least partially on the combined first and second diagnostic information,  
reconfiguring at least one of the component and the system.  
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2. The method of Claim 1, wherein monitoring a first diagnostic information of a  
component includes monitoring a health indication of the component.
3. The method of Claim 1, wherein monitoring a first diagnostic information of a  
15 component includes monitoring a capability indication of the component.
4. The method of Claim 1, wherein monitoring a first diagnostic information of a  
component includes monitoring a reliability indication of the component.
- 20 5. The method of Claim 1, wherein monitoring a first diagnostic information of a  
component includes monitoring a first diagnostic information of an actuator.
6. The method of Claim 1, wherein monitoring a second diagnostic information of a  
system includes monitoring a health indication of the system.  
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7. The method of Claim 1, wherein monitoring a second diagnostic information of a  
system includes monitoring a capability indication of the system.




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8. The method of Claim 1, wherein monitoring a second diagnostic information of a system includes monitoring a reliability indication of the system.

9. The method of Claim 1, wherein monitoring a second diagnostic information of a system includes monitoring a second diagnostic information of a flight control system.

10. The method of Claim 1, wherein reconfiguring at least one of the component and the system includes reconfiguring a flight control system to take into account a degradation of an actuator.

11. The method of Claim 1, further comprising feeding back the reconfiguring of the at least one of the component and the system into the fusion of the first and second diagnostic information.

12. The method of Claim 1, further comprising inputting the combined first and second diagnostic information into a maintenance support block.

13. The method of Claim 12, wherein inputting the combined first and second diagnostic information into a maintenance support block includes inputting the combined first and second diagnostic information into the maintenance support block to at least one of enable post-flight analysis and interpretation, and assist in assessing the prognosis of the component and system.

14. The method of Claim 1, further comprising detecting a level of degradation of the component that can be used to reduce false alarms in a Built-In Test system.

15. The method of Claim 14, further comprising trending one or more degradations to provide a prognostic capability.



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16. The method of Claim 1, wherein reconfiguring at least one of the component and the system includes reconfiguring at least one of the component and the system using an integrated vehicle health management system.

5 17. The method of Claim 1, further comprising integrating an integrated vehicle health management system with reconfigurable control, and performing tests of at least one of the component and the system during actual operation of the product.

18. A method of monitoring a component, comprising:

10 operating the component at a set of operating conditions;  
simultaneously with operating the component, inputting a command to the component;

simultaneously with inputting the command, monitoring at least some of the operating conditions

15 performing one or more analytical evaluations on the monitored operating conditions, including:

forming an input vector  $X$  containing the monitored operating conditions;

and

forming a linear combined vector set  $Y$  for a particular time  $i$  in the form  
20 of  $Y_i = e_i X = e_{1i} X_1 + e_{2i} X_2 + \dots + e_{iN} X_N$  where  $e$  represents the eigenvectors of the covariance matrix.

19. The method of Claim 18, wherein performing one or more analytical evaluations on the monitored operating conditions includes computing a health measurement function as a  
25 function of the eigenvalues of the covariance matrix.

20. The method of Claim 19, wherein the health measurement function is determined as *scale*  $(\lambda_{max}) \exp(BP(\lambda))$ .



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21. The method of Claim 18, wherein performing one or more analytical evaluations on the monitored operating conditions includes computing a health power spectrum as a function of the eigenvalues of the covariance matrix.

5 22. The method of Claim 21, wherein the health power spectrum is determined as

$$S_{hps}(w) = \sum_{k=-\infty}^{\infty} R_{lcf}(k) e^{-jwk}$$

23. The method of Claim 21, wherein the health power spectrum is developed from a Fast-Fourier Transform of an autocorrelation of the input vector X and the linear combined vector set Y.

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